SHARP Service Manual

MODEL SM-510H

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SPECIFICATIONS

Circuit; All silicon transistor pre/main amplifier with OTL, ITL & OCL circuit
Power source; 110/220/240V, 50/60Hz
Semiconductors; 9-transistor, 6-IC (Integrated circuit), 6-diode
Dimensions; 360(W) x 130(H) x 240 (D)mm
Weight; 5kg
Music power output; 2 x 30W Both channels drive at 1% T.H.D. (Total Harmonic Distortion), 4 ohm
Continuous power output; 2 x 13W Both channels drive at 1% T.H.D. 4 ohm
Distortion; 0.15% at 1W
Frequency response; 30Hz–20,000Hz ± 1.5dB
Output impedance; 4 or 8 ohm
Input sensitivity (at 13W output); PHONO-MAG: 3mV
PHONO-CERAMIC: 160mV
AUX,TUNER: 160mV
TAPE: 160mV
Output level; TAPE REC OUTPUT: 30mV

SHARP CORPORATION OSAKA, JAPAN

CHASSIS REMOVAL

1. Disconnect the power plug of the set.
2. Unscrew the 9 bolts (1) on the bottom, and the bottom board is removed, exposing the wiring on the chassis.
3. Remove the cabinet it our backward, the chassis and front panel will be removed from the chassis.
4. When removing the front panel (2), remove all knobs. After that, unscrew the up-and-down sides bolts (3) on the panel and pull out the panel forward.

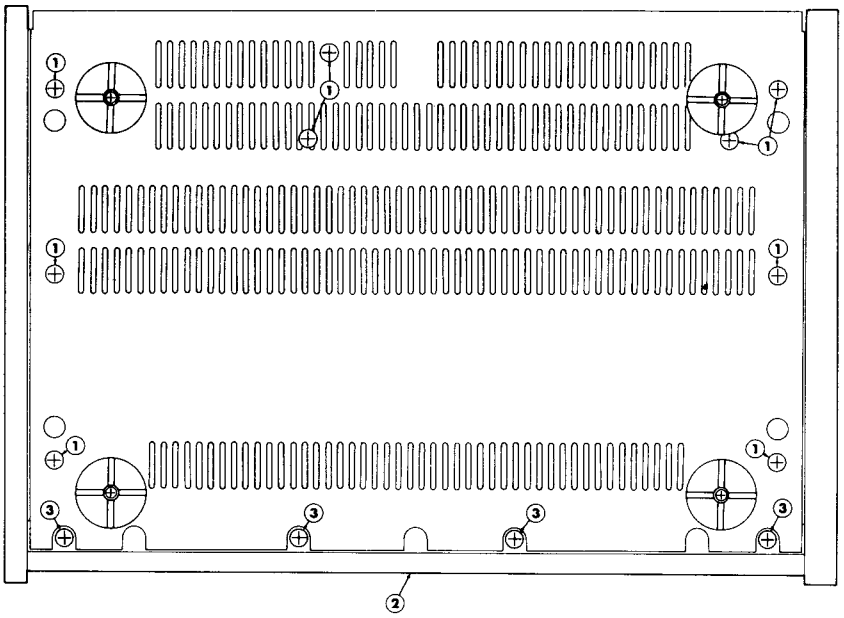


Fig. 1 Chassis Removal

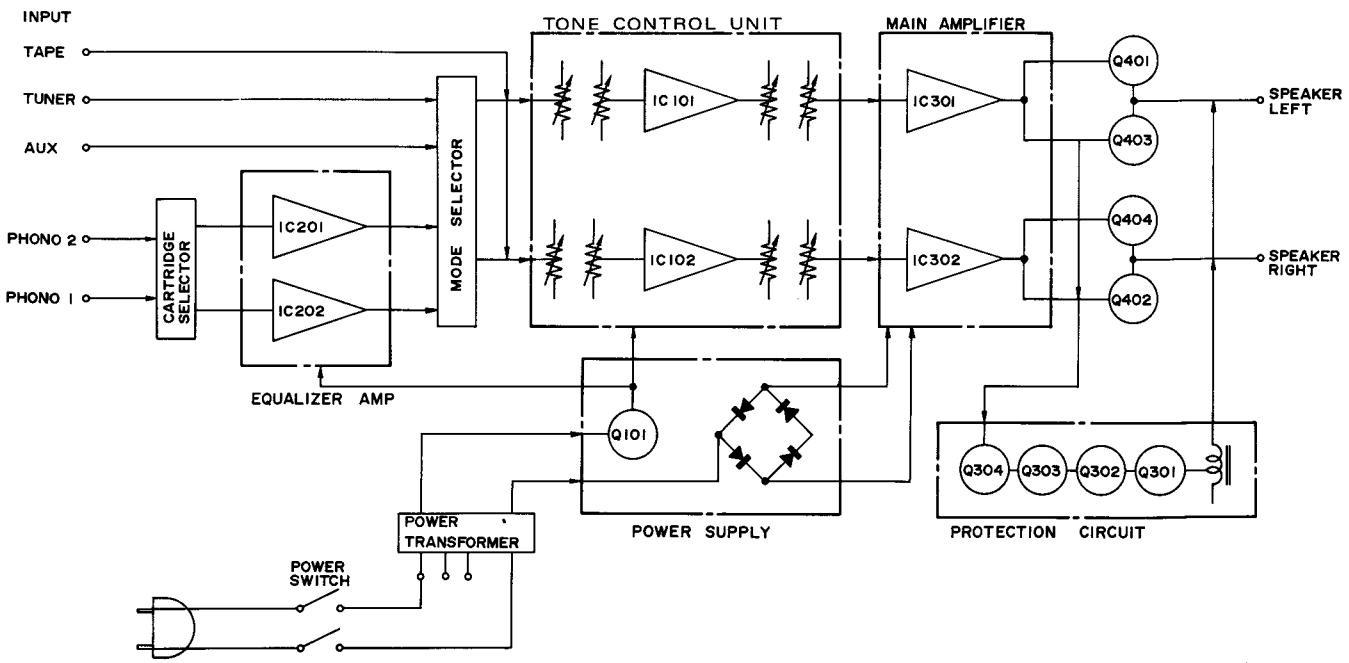


Fig. 2 Block Diagram

CIRCUIT DESCRIPTION

This is a highly IC-ed pre-main-amplifier with OCL (Output Capacitor Less) amplifier. It consists of equalizer amplifier, tone control unit, main amplifier protection circuit and power supplier. Followings are explanation about each circuitry and its operation.

1. MAIN AMPLIFIER

The main amplifier consists of driver IC and power transistor. The driver IC is specifically designed to drive the power transistor and the internal current limitter to protect the output power transistor from accidental shortcircuit or overload, being workable on either single or split power supply. The equivalent circuit of this IC is as shown in Fig. 3.

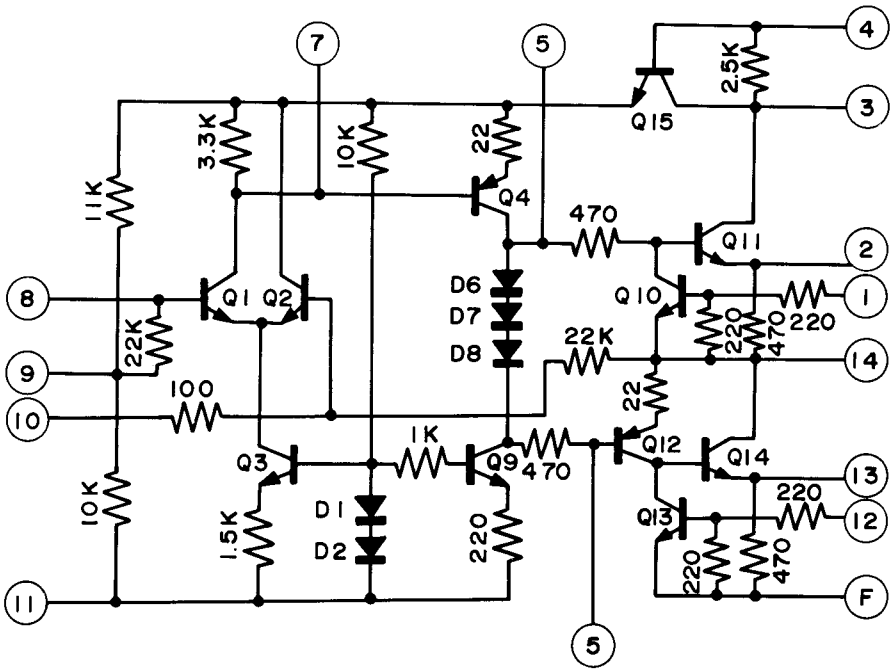


Fig. 3 Equivalent Circuit

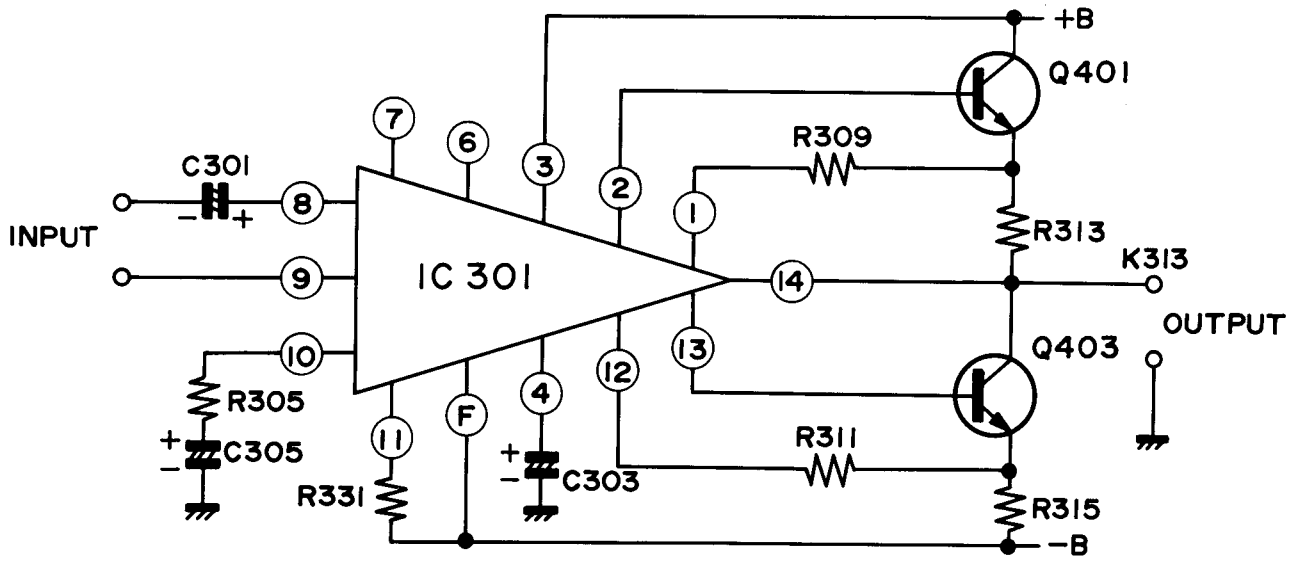


Fig. 4 Principle Circuit

Referring to the equivalent circuit in Fig. 3 and the principle circuit in Fig. 4, we explain the operation of the circuit. The input signal is applied in between K313 and earth and then to the PIN 8 via the C301. The Q1 and Q2 serve as differential amplifier, which works to connect the signal given with the single power supply (from the previous stage) with the amplifier operated on the split power supply. The Q3, D1 and D2 form constant voltage circuit. The signal, which is differencial-amplified in the Q1, is supplied to the base of Q4 via the PIN 7 . The D6 ~ D8, connected to the collector of Q4, give an appropriate bias to the next stage and also supply thereto the balanced signal with the earth positioned at the center. The Q11 is NPN transistor. These PNP and NPN transistors form complementary circuit. Therefore, the upper half of waveform is amplified at the Q401 via the PIN 2 and the lower half amplified at the Q403 via the PIN 13 , which then appear in the K313 as output waveform. Since the DC voltage of K313 is of OV, it is not needed to use the coupling capacitor conventionally employed in the SEPP type amplifier. (The name of OCL is derived from this fact.) The Q15 works to filter the ripple of +B if the capacitor is inserted to the PIN 4 . The Q11 and Q13 form current limitter. If an abnormal current runs in the Q401 and Q403, DC voltage increases in the R313 and R315 and reaches the base of Q10 and Q13 via the PIN 1 and 12 , causing the signal to be grounded. The minimum current required for operating this protection circuit can be adjusted by the values of the R309 and R311. The R305 is a resistor to determine the negative feedback amount. With the R305 lessened, the nagative feedback amount decreases, thus increasing the gain of the maplifier. To the PIN 6 and 7 is connected the capacitor for preventing the oscillation. The OCL amplifier is an ideal amplifier. from the following points; Its low frequency response characteristic is superior in particular because of the absence of the coupling capacitor, and flat reproduction is assured up to as low as 10Hz in the case of main amplifier alone. In addition, negative feedback is sufficiently applied due to the IC driver to remarkably lessen the distortion.

2. EQUALIZER AMPLIFIER

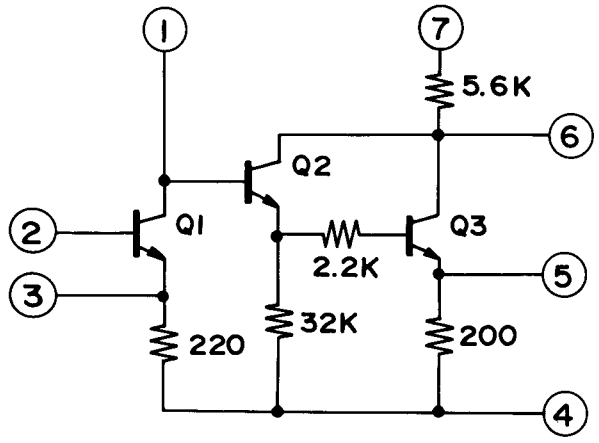


Fig. 5 Equivalent Circuit

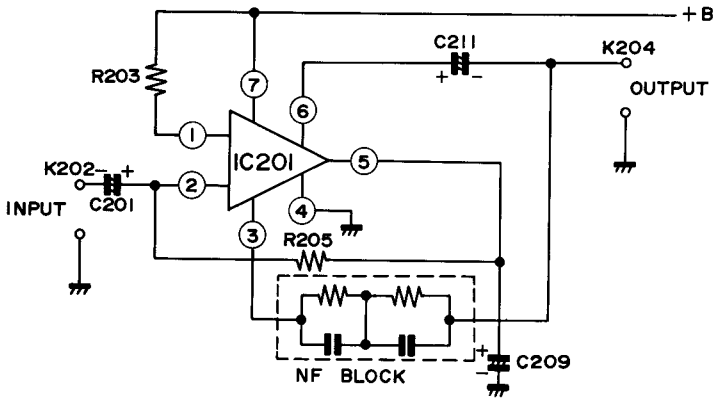


Fig. 6 Equalizer Amplifier

Explained here is the operation of this circuit. The internal equivalent circuit of the IC201 is of directcoupled 3-stage amplifier. The first stage Q1 serves as grounded emitter circuit and the input signal, coming via the K202, is amplified at the base of Q1 and then appears in the collector. In order to increase the collector load of Q1 the second stage Q2 and third stage Q3 are made an equivalent circuit with Darlington connection, thus the input impedance at the second stage is increased.

The last stage Q3 serves as grounded emitter circuit and obtains the output from the collector. The bias is supplied from the emitter (PIN 5) of Q3 to the base (PIN 2) of Q1 via the R205. (DC negative feedback type.)

This IC is developed for the low frequency high gain amplifier, of which the withstand voltage is higher enabling the power supply voltage to increase and then the dynamic range is significantly extended. It is also manufactured taking the advantage of PCT system (Perfect Crystal Device Technology) which lessens the noise. In addition, the gain of the first stage is increased as the load resistance of Q1 is made higher and also the noise in the next stage and on is limitted to the minimum. Therefore, the overall noise through the whole circuit is fully reduced.
The negative feedback block connected between the PIN 6 and 3 works to determine the frequency characteristic and gain of this amplifier. In this circuit is employed the parallel CR circuit to obtain RIAA curve characteristic but if the pure resistor is used instead for this circuit, this equalizer also serves as flat amplifier.

3. TONE CONTROL UNIT

The tone control unit is consisted of level controller, tone control amplifier and tone controller. The level controller comprises the balance control and volume control. As to the balance control of this set, MN type curve rotary variable resistor is employed. (See Fig. 7.)

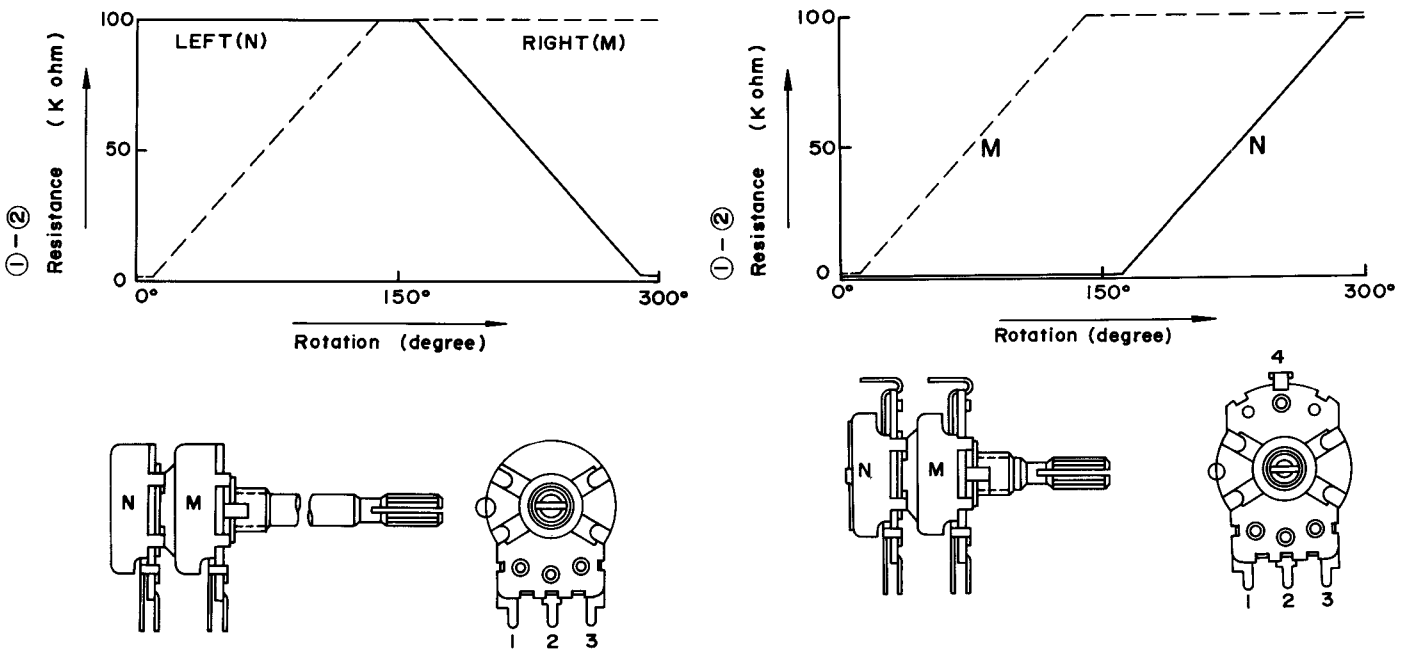


Fig. 7 Balance/Volume

In the tone control amplifier is applied the same IC as that for the equalizer amplifier described in the item 3 "EQUALIZER AMPLIFIER".
Their circuits are the same in basic structure but in the circuit of tone control amplifier is used pure resistor instead of the negative feedback block as in Fig. 6 to assure a flat frequency response characteristic. Since the tone control circuit herein is the CR type one which is conventionally employed, the explanation for it is omitted

4. PROTECTION CIRCUIT

As seen from the item(1) "MAIN AMPLIFIER", the protection circuit incorporated in the IC301 prevents the set from being affected by the overload signal due to the shortcircuit of speaker terminal, but the speaker happens to be burn out due to the employment of OCL circuit with which the DC current may run directly into the speaker if a big DC voltage is applied to between the earth K323 and output terminal K313 or K314 in the worst case. In an ordinary state, it scarcely occurs that DC voltage is applied to between the K323 and K313 or K314 because the IC-301 or IC302 incorporates the circuit to balance DC. DC is applied thereto only when the IC301 (or IC-302), Q401 and Q403 (or Q402 and Q404) are accidentally destroyed.

However, to further counteract the rare case above, the protection circuit formed by the Q301 ~ Q304 and relay is additionally provided to protect the speaker. When the plus DC voltage appears in between the K313 and K323, it is applied to the base of Q304 via the R329.

As the result the current runs in the Q304 and its collector voltage drops more abundantly than in the case of non-signal because of the R319. The Q302 and Q301 are PNP transistors.

The PNP transistor gets conductive when the base voltage becomes minus with respect to the emitter voltage, and therefore the current runs in the Q304 and also in the Q302, to cut off the Q301, then the relay stops to operate.

In a normal condition, as soon as the power switch is turned on, the relay starts to operate to connect the amplifier with the speaker.

In an abnormal condition, however, the relay is cut off to protect the speaker from possible damage. When the voltage between the speaker terminals is plus, the Q303 does not function but when it is minus, the Q303 functions to cut off the relay as in the case the voltage is plus.

The R329, C315 and C316 form low pass filter to prevent the relay being worked by audio signal. The relay is the inductive one and will generates reaction voltage if it is abruptly turned on or off. This voltage is absorbed by the D301, however. The minimum nubalanced DC voltage to make the relay operate is depended upon the value of R319 or R327.

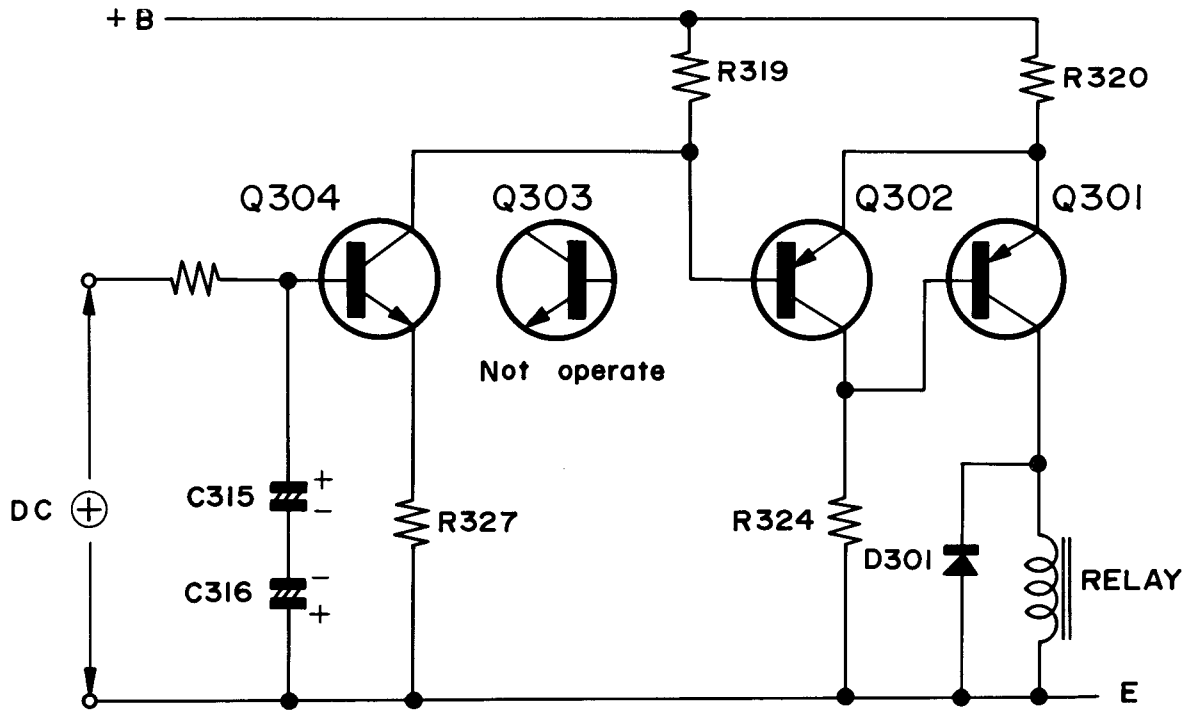


Fig. 8 Principle Protection Circuit

VOLTAGE SELECTOR PLUG & FUSE REPLACEMENT

1. AC LINE FUSE

When the unit does not function due to a blown fuse, remove the power cord and replace the old fuse on the fuse holder with a new once. Use a 1.0A fuse for 220V, 240V; 2.0A fuse for 110V.
NOTE: When replacing the fuse, never use a copper wire or other fuse of improper capacity.

2. CIRCUIT PROTECTION FUSE

Provied on the chassis near the Power Transformer. If sound through speakers are cut, the protection fuse has been blown. Turn the power switch off immediately remove the cabinet by loosing the screws on the side of the set, and check for a short on the connections between speaker enclosures and amplifier.
If short circuited repair it and replace the protection fuse.(0.5A).

3. VOLTAGE CHANGING

Be sure to check the pre-set voltage before operating the set. If the voltage, is different from your local voltage according to the voltage selector plug as follows:

1) Disconnect the AC power cord from the outlet in order to prevent an electric shock.
2) Remove the plug cover by unscrewing screw on it. (See Fig.9)
3) Pull out the selector plug cover and reinsert it with the desired voltage coming upward. (See Fig. 10)
4) Replace the plug cover in its original position.
   The desired voltage now appears in the plug cover opening. (See Fig. 9)

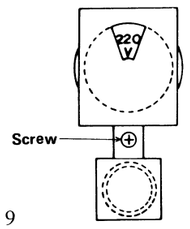


Figure 9

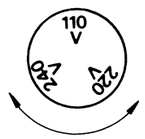


Figure 10

POWER TRANSISTOR REPLACEMENT

The power transistors used in the output stages are matched pairs. They have been selected so that they have very similar current gain and trans-conductance characteristics. This matching is necessary in order to assure optimum performance, but is such that if a transistor fails in either channel, another transistor in that channel must also be replaced. Transistors are supplied only in matched pairs for replacement.

The transistors diffuse a large amount of heat which must be carried off in order to prevent damage to the transistors the collectors of which are thermally connected to the heat sink by means of electrical insulators to avoid grounding. The insulator is a very thin plastic film mounted between the transistor case (collector) and the heat sink. A layer of silicon grease which is a good conductor of heat is applied to both sides of the insulator in order to improve heat sink operation. When the power transistors are replaced the spacer film must be re-installed and a new layer of grease applied to both sides. Care should be taken, lest conductive dust such as metal particles should break through the insulator films. Q401 and Q403,Q402 and Q404 are matched pairs.

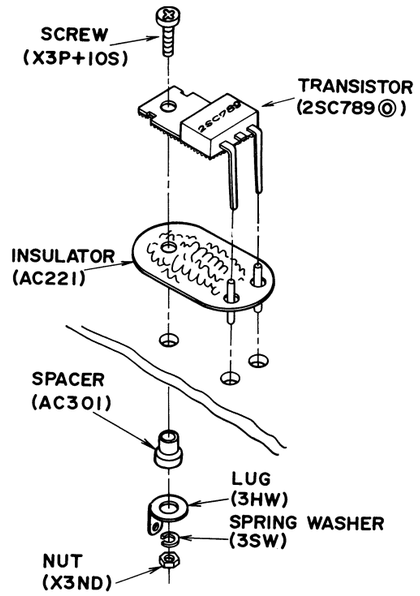
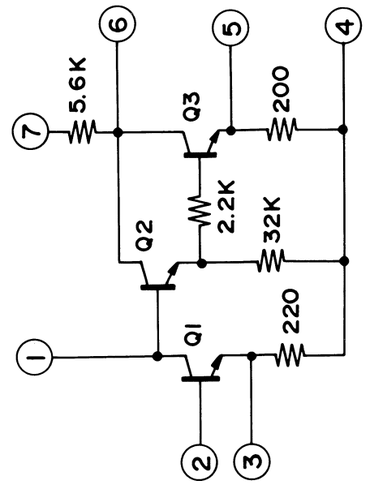
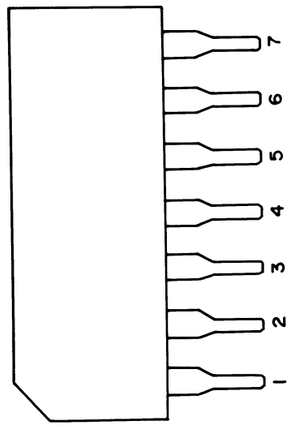
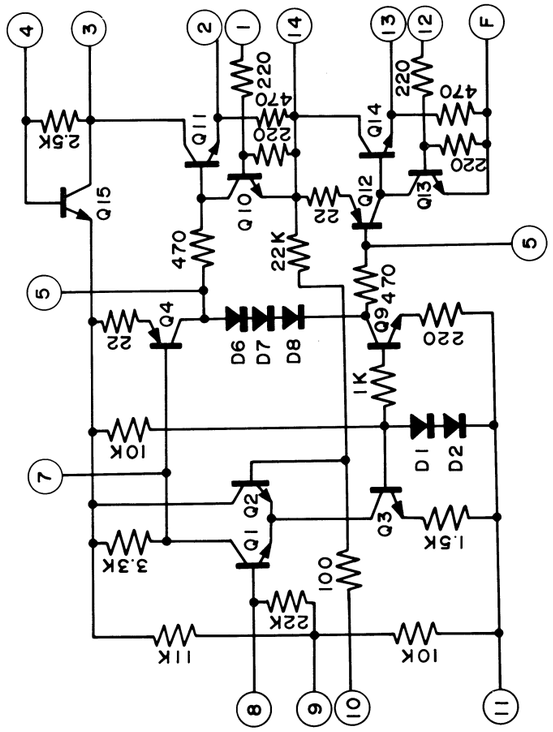


Figure 11 POWER TRANSISTOR REPLACEMENT







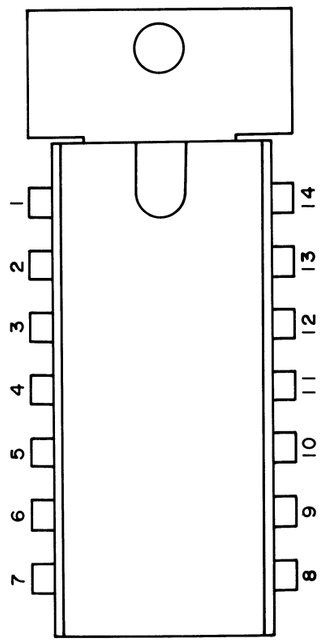
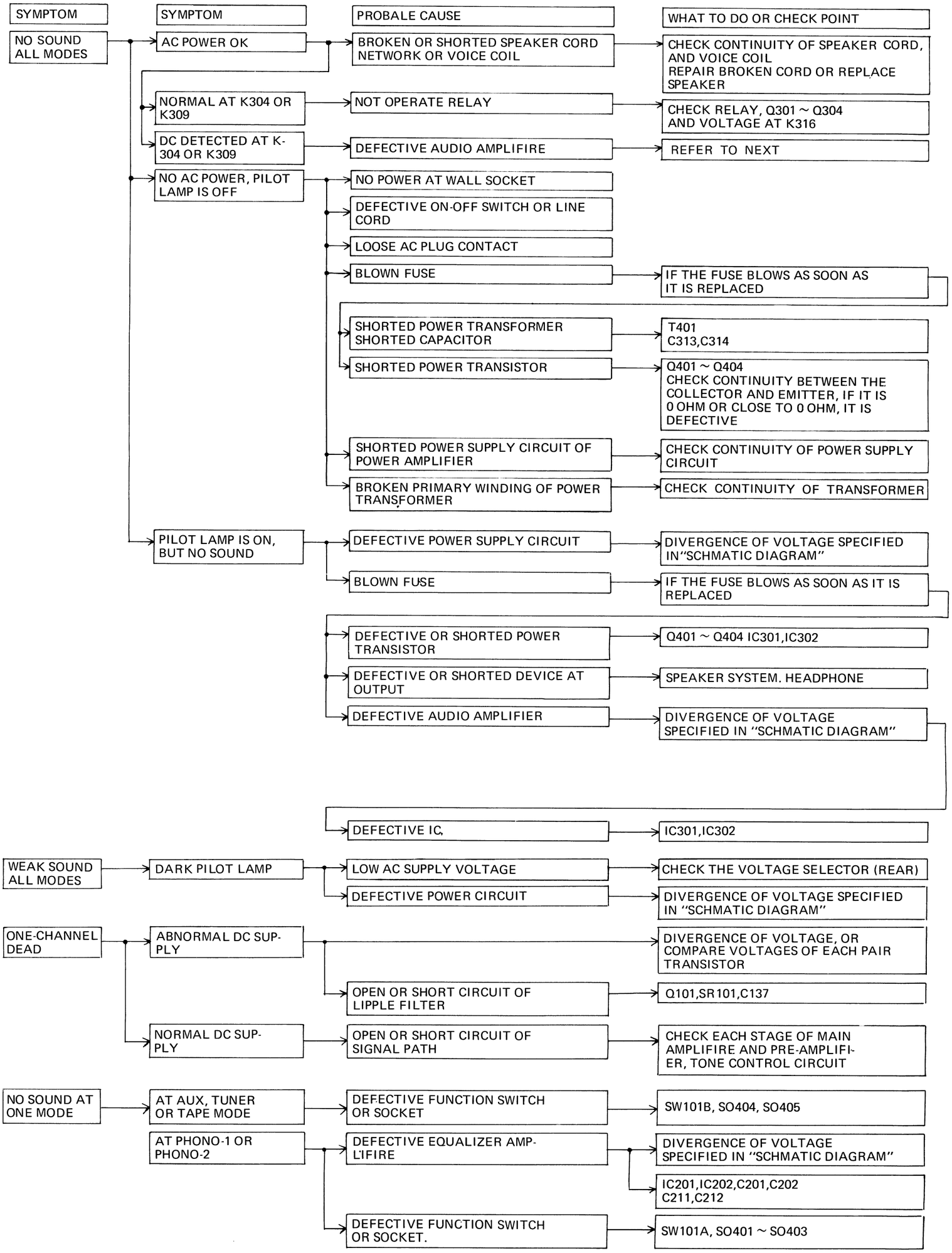


Figure 12 EQUIVALENT CIRCUIT OF INTEGRATED CIRCUIT

ALL OPERATIONAL MODES (1)


SYMPTOM
SYMPTOM
PROBALE CAUSE
WHAT TO DO OR CHECK POINT
NO SOUND ALL MODES
AC POWER OK
BROKEN OR SHORTED SPEAKER CORD NETWORK OR VOICE COIL
CHECK CONTINUITY OF SPEAKER CORD, AND VOICE COIL
REPAIR BROKEN CORD OR REPLACE SPEAKER
NORMAL AT K304 OR K309
NOT OPERATE RELAY
CHECK RELAY, Q301 ~ Q304 AND VOLTAGE AT K316
DC DETECTED AT K-304 OR K309
DEFECTIVE AUDIO AMPLIFIRE
REFER TO NEXT
NO AC POWER, PILOT LAMP IS OFF
NO POWER AT WALL SOCKET
DEFECTIVE ON-OFF SWITCH OR LINE CORD
LOOSE AC PLUG CONTACT
BLOWN FUSE
IF THE FUSE BLOWS AS SOON AS IT IS REPLACED
SHORTED POWER TRANSFORMER SHORTED CAPACITOR
T401 C313,C314
SHORTED POWER TRANSISTOR
Q401 ~ Q404 CHECK CONTINUITY BETWEEN THE COLLECTOR AND EMITTER, IF IT IS 0 OHM OR CLOSE TO 0 OHM, IT IS DEFECTIVE
SHORTED POWER SUPPLY CIRCUIT OF POWER AMPLIFIER
CHECK CONTINUITY OF POWER SUPPLY CIRCUIT
BROKEN PRIMARY WINDING OF POWER TRANSFORMER
CHECK CONTINUITY OF TRANSFORMER
PILOT LAMP IS ON, BUT NO SOUND
DEFECTIVE POWER SUPPLY CIRCUIT
DIVERGENCE OF VOLTAGE SPECIFIED IN "SCHMATIC DIAGRAM"
BLOWN FUSE
IF THE FUSE BLOWS AS SOON AS IT IS REPLACED
DEFECTIVE OR SHORTED POWER TRANSISTOR
Q401 ~ Q404 IC301,IC302
DEFECTIVE OR SHORTED DEVICE AT OUTPUT
SPEAKER SYSTEM. HEADPHONE
DEFECTIVE AUDIO AMPLIFIER
DIVERGENCE OF VOLTAGE SPECIFIED IN "SCHMATIC DIAGRAM"
DEFECTIVE IC.
IC301,IC302
WEAK SOUND ALL MODES
DARK PILOT LAMP
LOW AC SUPPLY VOLTAGE
CHECK THE VOLTAGE SELECTOR (REAR)
DEFECTIVE POWER CIRCUIT
DIVERGENCE OF VOLTAGE SPECIFIED IN "SCHMATIC DIAGRAM"
ONE-CHANNEL DEAD
ABNORMAL DC SUP-PLY
DIVERGENCE OF VOLTAGE, OR COMPARE VOLTAGES OF EACH PAIR TRANSISTOR
OPEN OR SHORT CIRCUIT OF LIPPLE FILTER
Q101,SR101,C137
NORMAL DC SUP-PLY
OPEN OR SHORT CIRCUIT OF SIGNAL PATH
CHECK EACH STAGE OF MAIN AMPLIFIRE AND PRE-AMPLIFI-ER, TONE CONTROL CIRCUIT
NO SOUND AT ONE MODE
AT AUX, TUNER OR TAPE MODE
DEFECTIVE FUNCTION SWITCH OR SOCKET
SW101B, SO404, SO405
AT PHONO-1 OR PHONO-2
DEFECTIVE EQUALIZER AMP-L'IFIRE
DIVERGENCE OF VOLTAGE SPECIFIED IN "SCHMATIC DIAGRAM"
IC201,IC202,C201,C202 C211,C212
DEFECTIVE FUNCTION SWITCH OR SOCKET.
SW101A, SO401 ~ SO403

ALL OPERATIONAL MODES(2)

SYMPTOM	SYMPTOM	PROBABLE CAUSE	WHAT TO DO OR CHECK POINT
DISTORTION IN ALL MODES OF OPERATION	REPLACE SPEAKER AND OK	DEFECTIVE VOICE COIL, CONE OR DAMPER OF SPEAKER	REPLACE SPEAKER
		INSUFFICIENT VOLTAGE OF POWER CIRCUIT	VOLTAGES NOT AS SPECIFIED
	ONE CHANNEL IS OK, OTHER IS DISTORTED	DEFECTIVE AUDIO FREQUENCY CIRCUIT	
		AGING OR WEAK IC	IC101,IC102,IC201,IC202,IC301,IC302
		OPEN OR SHORTS IN NEGATIVE FEEDBACK CIRUIT	R111,R112,R207 ~ R210 C205 ~ C208
HUM IN ALL MODES	HIGH LEVEL OF RIPPLE IN DC SOURCE	DEFECTIVE RIPPLE FILTER	C128,C137,C129
	RIPPLE IN POWER SUPPLY CIRCUIT OF PREAMPLIFIER	DEFECTIVE RIPPLE FILTER	C313,C314,C319,C320
		OPEN CIRCUIT OF GROUND CONNEC-TION BETWEEN PRE-AMPLIFIER AND CHASSIS	K209 TO CHASSIS
		SHORT CIRCUIT OF EARTH OF POWER AMPLIFIER OR OTHER AUDIO UNIT TO CHASSIS, ESPECIALLY HEADPHONE JACK TO CHASSIS	AF UNIT TO CHASSIS, J401 TO CHASSIS
NOISY IN ALL MODES	RESONANT SPEAKER	INNER CONTACT OF SPEAKER COMPONENT OR DUST	FIX SCREWS AGAIN, KEEP AWAY RESONANT TIP FROM CORN OF SPEAKER
		DEFECTIVE VARIABLE RESISTOR	REPLACE SPEAKER
	NOISY CONTROLS	DEFECTIVE SPEAKER	VR101 ~ VR104
LOUDNESS CONTOUR SWITCH DOES NOT WORK AT ALL		VOLUME CONTROL IS IN OVER REVOLUTION	NORMAL
		DEFECTIVE LOUDNES CONTOUR SWITCH OR CIRCUIT	SW403
CONTROL DOES DOES NOT WORK	BASS CONTROL	DEFECTIVE VR103 OR CIRCUIT	
	TREBLE CONTROL	DEFECTIVE VR104 OR CIRCUIT	
	BALANCE CONTROL	DEFECTIVE VR101 OR CIRCUIT	

USING WITH INPUT OR OUTPUT TERMINALS (PHONO TAPE etc.)

SYMPTOM	SYMPTOM	PROBABLE CAUSE	WHAT TO DO OR CHECK POINT
NO SOUND OR WEAK SOUND		INPUT SOURCE DEFECTIVE	REPLACE INPUT SOURCES TO CHECK
		LOOSE CONTACT ON SELECTOR SWITCH	SW401A,SW101B
		LOOSE CONTACTS OF INPUT TERMINAL PIN JACK OR DIN TERMINAL	SO401 ~SO405
		BROKEN LOAD CIRCUIT BETWEEN TERMINALS TO AMPLIFIER	CHECK AND REPAIR
		DEFECTIVE EQUALIZER	DIVERGENCE OF VOLTAGE SPECIFIED IN "SCHMATIC DIAGRAM"
		DEFECTIVE TRANSISTOR	IC201,IC202
		DEFECTIVE RESISTOR	R215, R216, etc.
		DEFECTIVE CAPACITOR	C201,C202,C211,C212 etc.
TAPE PLAY DOES NOT WORK	AMPLIFIER IS OK	TAPE RECORDER DEFECTIVE	REPLACE TAPE RECORDER
		LOOSE CONTACT OF TAPE MONITOR SWITCH	SW402

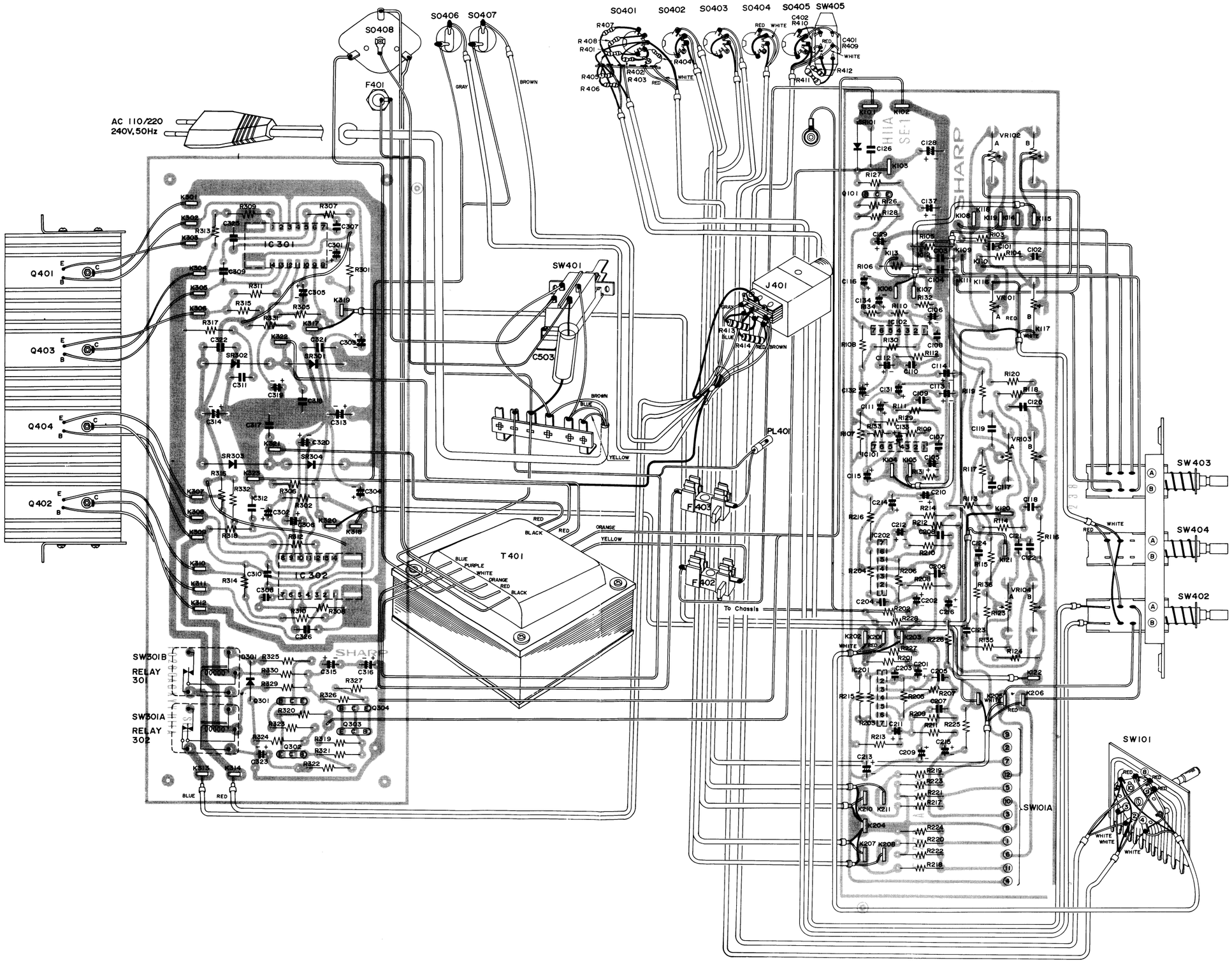
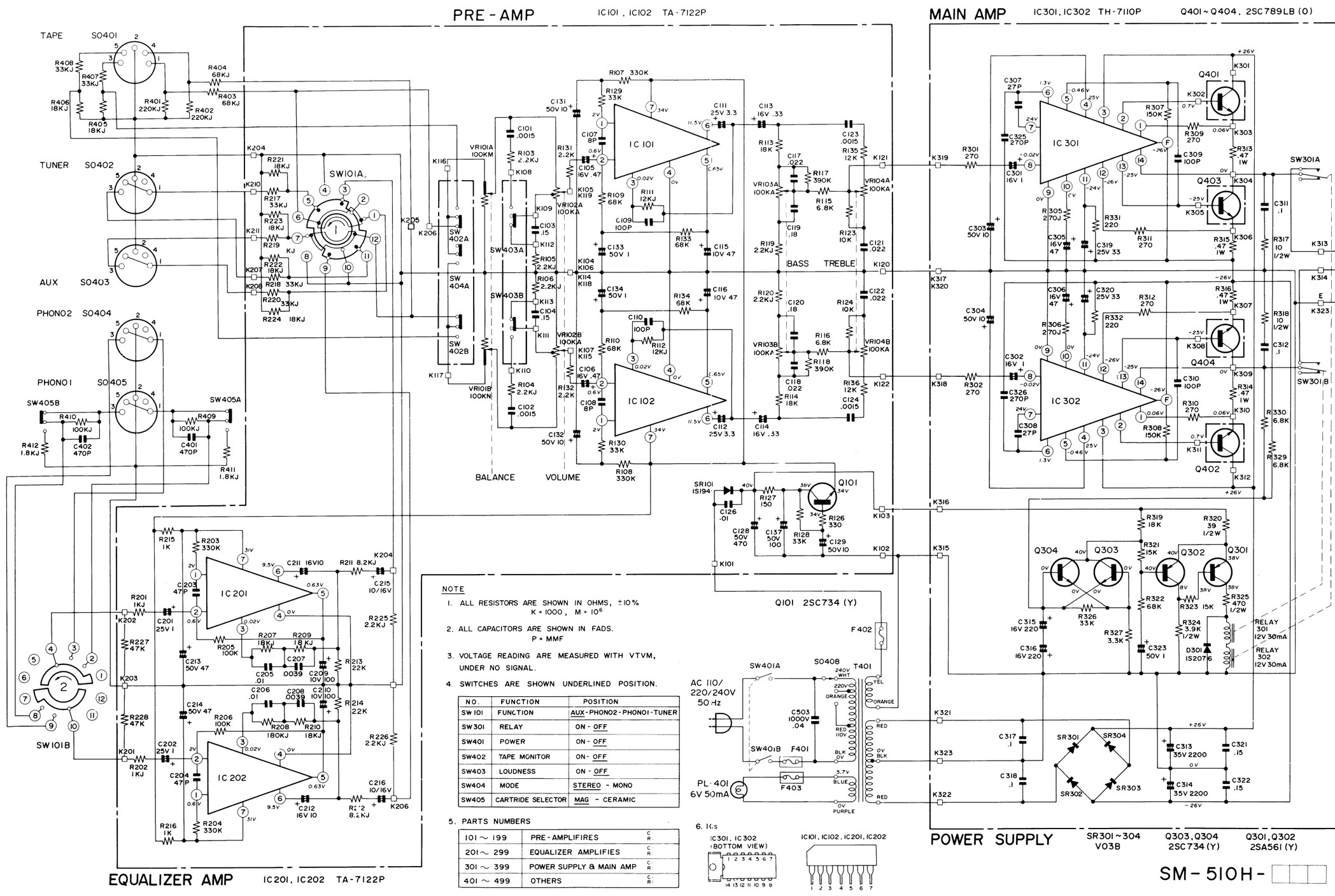


Figure 13 PRE/MAIN AMP BOARD WIRING SIDE



NOTE

1. ALL RESISTORS ARE SHOWN IN OHMS, ±10%
   K = 1000, M = 10^6
2. ALL CAPACITORS ARE SHOWN IN FADS.
   P = MMF
3. VOLTAGE READING ARE MEASURED WITH VTVM, UNDER NO SIGNAL.
4. SWITCHES ARE SHOWN UNDERLINED POSITION.

NO.	FUNCTION	POSITION
SW 101	FUNCTION	AUX - PHONO2 - PHONO1 - TUNER
SW 301	RELAY	ON - OFF
SW401	POWER	ON - OFF
SW402	TAPE MONITOR	ON - OFF
SW403	LOUDNESS	ON - OFF
SW404	MODE	STEREO - MONO
SW405	CARTRIDE SELECTOR	MAG - CERAMIC

5. PARTS NUMBERS

		C/R
101 ~ 199	PRE-AMPLIFIRES	C R
201 ~ 299	EQUALIZER AMPLIFIES	C R
301 ~ 399	POWER SUPPLY & MAIN AMP	C R
401 ~ 499	OTHERS	C R

6. I.C.s

IC301, IC302 (BOTTOM VIEW)

IC101, IC102, IC201, IC202

Figure 14 SCHEMATIC DIAGRAM

SHARP

PARTS LIST

MODEL
SM-510H

"HOW TO ORDER REPLACEMENT PARTS"
To have your order filled promptly and correctly, please furnish the following informations.
1. MODEL NUMBER
2. REF. NO.
3. NEW PART NO.
4. DESCRIPTION

MODEL SM-510H

REF. NO.	NEW PART NO.	OLD PART NO.	DESCRIPTION		
		CAPACITORS			
C101,C102	VCQYKU1HM152K	ML-5-156K	.0015MFD, 50V ±10%, Mylar		
C103,C104	VCKYPU1NB154M	D-1.2-154M	.15MFD, 12V, ±20%, Discap		
C105,C106	VCAAKU1CA474M	AD1.6-474M	.47MFD, 16V, ±20%, Electrolytic		
C107,C108	VCCSPU1HL8R0C	D-5-809C	8PF, 50V, ±0.25PF, Discap		
C109,C110	VCCSPU1HL271K	D-5-277K	270PF, 50V, ±10%, Discap		
C111,C112	VCEAAU1EW335R	CU2.5-333R	3.3MFD, 25V, +150%, – 10%, Electrolytic		
C113,C114	VCAAKU1CA334M	AD1.6-334M	.33MFD, 16V, ±20%, Electrolytic		
C115,C116	VCEAAU1AW476Q	CU-1-472Q	47MFD, 10V, +100%, – 10%, Electrolytic		
C117,C118	VCQYKU1HM223K	ML-5-225K	,022MFD, 50V, ±10%, Mylar		
C119,C120	VCQYKU1HM184K	ML-5-184K	.18MFD, 50V, ±10%, Mylar		
C121,C122	VCQYKU1HM223K	ML-5-225K	.022MFD, 50V, ±10%, Mylar		
C123,C124	VCQYKU1HM152K	ML-5-156K	.0015MFD, 50V, ±10%, Mylar		
C126	VCKYPU2HB103P	D-50-105P	.01MFD, 500V, +100%, –0%, Discap		
C128	VCEAAU1HW477Q	CU-5-471Q	470MFD, 50V, +100%, –10%, Electrolytic		
C129	VCEAAU1HW106Q	CU-5-102Q	10MFD, 50V, +100%, –10%, Electrolytic		
C131,C132	VCEAAU1HW106Q	CU-5-102Q	10MFD, 50V, +100%, –10%, Electrolytic		
C133,C134	VCEAAU1HW105R	CU-5-103R	1MFD, 50V, +150%, –10%, Electrolytic		
C137	VCEAAU1HW107Q	CU-5-101Q	100MFD, 50V, +100%, –10%, Electrolytic		
C201,C202	VCAAKU1CA334M	AD2.5-103M	1MFD, 25V, ±20%, Electrolytic		
C203,C204	VCCSPU1HL470K	D-5-478K	47PF, 50V, ±10%, Discap		
C205,C206	VCQYKU1HM103K	ML-5-105K	.01MFD, 50V, ±10%, Mylar		
C207,C208	VCQYKU1HM392K	ML-5-396K	.0039MFD, 50V, ±10%, Mylar		
C209,C210	VCEAAU1AW107Q	CU-1-101Q	100MFD, 10V, +100%, –10%, Electrolytic		
C211,C212	VCEAAU1CW106Q	CU1.6-102Q	10MFD, 16V, +100%, –10%, Electrolytic		
C213,C214	VCEAAU1HW476Q	CU-5-472Q	47MFD, 50V, +100%, –10%, Electrolytic		
C215,C216	VCEAAU1HW105R	CU-5-103R	1MFD, 50V, +150%, –10%, Electrolytic		
C301,C302	VCAAKU1CA105M	AD1.6-103M	1MFD, 16V, ±20%, Electrolytic		
C303,C304	VCEAAU1HW106Q	CU-5-102Q	10MFD, 50V, +100%, – 10%, Electrolytic		
C305,C306	VCEAAU1CW476Q	CU1.6-472Q	47MFD, 16V, +100%, – 10%, Electrolytic		
C307,C308	VCCSPU1HL270K	D-5-278K	27PF, 50V, ±10%, Discap		
C309,C310	VCCSPU1HL101K	D-5-107K	100PF, 50V, ±10%, Discap		
C311,C312	VCQYKU1HM104K	ML-5-104K	.1MFD, 50V, ±10%, Mylar		
C313,C314	VCEAAU1VW228Q	CU3.5-220Q	2200MFD, 35V, +100%, – 10%, Electrolytic		
C315,C316	VCEAAU1CW227Q	CU1.6-221Q	220MFD, 16V, +100%, – 10%, Electrolytic		
C317,C318	VCQYKU1HM104K	ML-5-104K	.1MFD, 50V, ±10%, Mylar		
C319,C320	VCEAAU1EW336Q	CU2.5-332Q	33MFD, 25V, +100%, – 10%, Electrolytic		
C321,C322	VCQYKU1HM154K	ML-5-154K	.15MFD, 50V, ±10%, Mylar		
C323	VCEAAU1HW105R	CU-5-103R	1MFD, 50V, +150%, – 10%, Electrolytic		

REF. NO.	NEW PART NO.	OLD PART NO.	DESCRIPTION		
C325,C326	VCCSPU1HL271K	D-5-277K	270PF, 50V, ±10%, Discap		
C401,C402	VCCSPU1HL471K	D-5-477K	470PF, 50V, ±10%, Discap		
C503	VCPOAT3AC403M	OL-1K-405M	.04MFD, 1000V, ±20%, Oil		
			RESISTORS		
			(Unless otherwise specified resistors are ¼W, ±10%, Carbon type.)		
R103,R104,R105,R106	VRD-ST2EY222J	1/4SA2.2KJ	2.2K ohm, ¼W, ±5%, Carbon		
R107,R108	VRD-ST2EY334K	1/4SA330KK	330K ohm		
R109,R110	VRD-ST2EY683K	1/4SU-68KK	68K ohm		
R111,R112	VRD-ST2EY123J	1/4SA-12KJ	12K ohm, ¼W, ±5%, Carbon		
R113,R114	VRD-ST2EY183K	1/4SA-18KK	18K ohm		
R115,R116	VRD-ST2EY682K	1/4SA6.8KK	6.8K ohm		
R117,R118	VRD-SU2EY394K	1/4SU390KK	390K ohm		
R119,R120	VRD-SU2EY222K	1/4SU2.2KK	2.2K ohm, ¼W, ±5%, Carbon		
R123,R124	VRD-ST2EY103K	1/4SA-10KK	10K ohm		
R126	VRD-ST2EY331K	1/4SA-330K	330 ohm		
R127	VRD-ST2EY151K	1/4SA-150K	150 ohm		
R128,R129,R130	VRD-ST2EY333K	1/4SA-33KK	33K ohm		
R131,R132	VRD-ST2EY222J	1/4SA2.2KJ	2.2K ohm		
R133,R134	VRD-SU2EY683K	1/4SU-68KK	68K ohm		
R135,R136	VRD-ST2EY123K	1/4SA-12KK	12K ohm		
R201,R202	VRD-ST2EY102J	1/4SA-1KJ	1K ohm, ¼W, ±5%, Carbon		
R203,R204	VRD-ST2EY334K	1/4SA330KK	330K ohm		
R205,R206	VRD-ST2EY104K	1/4SA100KK	100K ohm		
R207,R208	VRD-ST2EY184J	1/4SA180KJ	180K ohm, ¼W, ±5%, Carbon		
R209,R210	VRD-ST2EY183J	1/4SA-18KJ	18K ohm, ¼W, ±5%, Carbon		
R211,R212	VRD-ST2EY822J	1/4SA8.2KJ	8.2K ohm, ¼W, ±5%, Carbon		
R213,R214	VRD-ST2EY223K	1/4SA22KK	22K ohm		
R215,R216	VRD-ST2EY102K	1/4SA-1KK	1K ohm		
R217,R218,R219,R220	VRD-ST2EY333J	1/4SA-33KJ	33K ohm, ¼W, ±5%, Carbon		
R221,R222,R223,R224	VRD-ST2EY183J	1/4SA-18KJ	18K ohm, ¼W, ±5%, Carbon		
R225,R226	VRD-ST2EY222J	1/4SA2.2KJ	2.2K ohm, ¼W, ±5%, Carbon		
R227,R228	VRD-ST2EY473K	1/4SA-47KK	47K ohm		
R301,R302	VRD-ST2EY271K	1/4SA-270K	270 ohm		
R305,R306	VRD-ST2EY271J	1/4SA-270J	270 ohm, ¼W, ±5%, Carbon		
R307,R308	VRD-ST2EY154K	1/4SA150KK	150K ohm		
R309,R310,R311,R312	VRD-ST2EY271K	1/4SA-270K	270 ohm		
R313,R314,R315,R316	VRF-GV3ABR47K		.47 ohm, 1W, ±10%, Cement		
R317,R318	VRC-MT2HG100K	1/2M-10K	10 ohm, ½W, ±10%, Carbon		
R319	VRD-ST2EY183K	1/4SA-18KK	18K ohm		
R320	VRC-MT2HG390K	1/2M-39K	39 ohm, ½W, ±10%, Carbon		
R321	VRD-ST2EY153K	1/4SA-15KK	15K ohm		
R322	VRD-ST2EY683K	1/4SA-68KK	68K ohm		
R323	VRD-ST2EY153K	1/4SA-15KK	15K ohm		
R324	VRC-MT2HG392K	1/2M-3.9KK	3.9K ohm, ½W, ±10%, Carbon		
R325	VRC-MT2HG471K	1/2M-470K	470 ohm, ½W, ±10%, Carbon		
R326	VRD-ST2EY333K	1/4SA-33KK	33K ohm		
R327	VRD-ST2EY332K	1/4SA3.3KK	3.3K ohm		
R329,R330	VRD-ST2EY682K	1/4SA6.8KK	6.8K ohm		
R331,R332	VRD-ST2EY221K	1/4SA-220K	220 ohm		
R401,R402	VRD-ST2EY224J	1/4SA220KJ	220K ohm, 1/4W, ±5%, Carbon		
R403,R404	VRD-ST2EY683J	1/4SA-68KJ	68K ohm, 1/4W, ±5%, Carbon		

REF. NO.	NEW PART NO.	OLD PART NO.	DESCRIPTION		
			RESISTORS		
R405,R406	VRD-ST2EY193J	1/4SA-19KJ	19K ohm, 1/4W, ±5%, Carbon		
R407,R408	VRD-ST2EY333J	1/4SA-33KJ	33K ohm, 1/4W, ±5%, Carbon		
R409,R410	VRD-ST2EY104J	1/4SA100KJ	100K ohm, 1/4W, ±5%, Carbon		
R411,R412	VRD-ST2EY122J	1/4SA1.2KJ	1.2K ohm, 1/4W, ±5%, Carbon		
R413,R414	VRC-MT2HG221K	1/2M-220K	220 ohm, 1/2W, ±10%, Carbon		
			CONTROLS		
VR101	RVR-Z0037AGZZ		100K ohm, BALANCE		
VR102	RVR-A0065AGZZ		100K ohm, VOLUME		
VR103	RVR-A0033AGZZ		100K ohm, BASS		
VR104	RVR-A0033AGZZ		100K ohm, TREBLE		
			SEMICONDUCTORS		
Q101	VS2SC734-Y/-1	2SC734Y	Transistor, Ripple Filter		
Q301	VS2SA561-Y/-1	2SA561Y	Transistor, Protection Circuit		
Q302	VS2SA561-Y/-1	2SA561Y	Transistor, Protection Circuit		
Q303	VS2SC734-Y/-1	2SC734Y	Transistor, Protection Circuit		
Q304	VS2SC734-Y/-1	2SC734Y	Transistor, Protection Circuit		
Q401,Q402,Q403,Q404	VS2SC789LBO-1	2SC789LBO	Transistor, Power Amp		
IC101,IC102	RH-IX0002SGZZ		Integrated Circuit, Pre-Amp		
IC201,IC202	RH-IX0002SGZZ		Integrated Circuit, Equalizer		
IC301,IC302	RH-IX0423AGZZ		Integrated Circuit, Driver Amp		
D301	VHD1S2076//-1	IS2076	Diode, Surge Protection		
SR101	VHDIS1941//-1	IS1941	Rectifier		
SR301,SR302,SR303,SR304	RH-DX0033AGZZ	VO3B	Rectifier		
			MISCELLANEOUS		
SO401	QSOCZ0022AGZZ	SO-971	Socket, TAPE		
SO402	QSOCZ0022AGZZ	SO-971	Socket, TUNER		
SO403	QSOCZ0022AGZZ	SO-971	Socket, AUX		
SO404	QSOCZ0022AGZZ	SO-971	Socket, PHONO-2		
SO405	QSOCZ0022AGZZ	SO-971	Socket, PHONO-1		
SO406	QSOCJ0203SEZZ	SO-035	Socket, Speaker LEFT		
SO407	QSOCJ0203SEZZ	SO-035	Socket, Speaker RIGHT		
SW101	QSW-R0064AGZZ		Switch, Function		
SW301	Not available		Switch, Parts of Relay		
SW401	QSW-P0012AGZZ	X6S-85SEV	Switch, POWER		
SW402	QSW-P0043AGZZ		Switch, TAPE MONITOR		
SW403			Switch, LOUDNESS		
SW404			Switch, MODE		
SW405	QSW-S0035AGSA	5S-69	Switch, CARTRIDGE SELECTOR		
F401	QFS-A202AAGNI	FUSE-2.0S	Fuse, 2.0AT (110V)		
	QFS-D102AAGNI	FUSE-1.0S	Fuse, 1.0AT (220/240V)		
F402	QFS-D501AAGNI	FUSE-0.5S	Fuse, 0.5A		
F403	QFS-D501AAGNI	FUSE-0.5S	Fuse, 0.5A		
SO408	QSOCE0301AGZZ	SO-037	Voltage Selector		
J401	QJAKJ0002AGZZ		Jack, HEADPHONES		
RELAY301,RELAY302	RRLYZ0010AGZZ		Relay, Protection Circuit		
T401	RTRNP0273AGZZ		Transformer, Power		
PL401	PLMPM0018AG00	PL-2515UL	Pilot Lamp		
	LANGR0294AGZZ		Bracket, Volume Control		
	LANGR0289AGZZ		Bracket, Switches		
	PGUMM0025AG09		Holder, Rubber, Pilot Lamp		
	LANGQ0308AGFT		Bracket, Terminal		

MODEL
SM-510H

SHARP

PARTS LIST

REF. NO.	NEW PART NO.	OLD PART NO.	DESCRIPTION		
	QFSHZ0004AGZZ	FH-949	Fuse Holder, F401		
	QLUGL0501SEZZ	LG-973	Lug Terminal, 5 Pin		
	QTANN9007AGZZ	XT-115	Terminal, Ground		
	LX-LZ0001AGZZ	3TOK-PB	Rivet, Socket Retaining		
	LANGT0063AGZZ	HON-A-3779	Bracket, Heatsink		
	PRDAR0049AGFW		Heatsink		
	PSPAZ9002AGZZ	AC221	Spacer, Insulator		
	PSPAZ9006AGZZ	AC301	Washer, Insulator		
	QACCZ0006AG00	ACC-297	AC Cord, 3 para (Without Plug)		
	QACCB0002AG09	ACC-331BS	AC Cord, 2 para (Without Plug)		
	QACCS0004AG00	ACC-325SEV	AC Cord, Black, 2 Para		
	QPLGA0205AGZZ	PG-439	Plug, AC Cord (2 Para, Black)		
	QACCV0001AGZZ		AC Cord, 2 Para (With Plug)		
	QFSHC2001SEZZ	FH-127	Fuse Holder, F402/F403		
	LCHSM0139AGZZ		Mounting Plate, P.W.B.		
	PSPAN0004AF09	SPACER911B	Spacer, Headphone Jack		
	PSPAI0017AF00	SPAC-4062D	Washer, Headphone Jack		
	LX-NZ0013AGFN	9TOK-NK	Nut, Headphone Jack		
	LBSHC0002AGZZ	5P-4	Bush, 3 Para Cord		
	LBSHC0007AGZZ	4P-4	Bush, 2 Para Cord		
	QLUGL0426AGZZ	LG-462Z	Lug Terminal, 4 Pin, 2 Ground		
	PSPAI0052AGZZ	K-SPACER	Spacer, Power Switch Knob		
	JKNBP0012AGSB	8K-606	Knob, POWER/MODE/LOUDNESS/ TAPE MONITOR		
	PSPAS0010AGZZ		Spacer, Push Switch		
	HDECQ0005CESA	PL-DEC-P	Decoration, Pilot Lamp		
	PSPAS0008AGZZ	K-SPAC0090	Spacer, Power Switch Knob		
	HPNLC3149AGSA		Panel, Controls		
	JKNBN0127AGSA		Knob, VOLUME/BALANCE/ BASS/TREBLE		
	JKNBN0110AGSA	8K-596	Knob, Input Selector		
	GCAB-0063AGSA	X2CAB-0006	Cabinet		
	QPLGS0504AGZZ	PG-453	Plug, Short		
	GCOVH3059AGFT	SO-COV0006	Bracket, Socket Cover		

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